

Listing of Claims:

1. (Original) A power converter apparatus comprising a multi-resonant circuit comprising a series-resonant circuit and a frequency-dependent impedance connected in series with the series-resonant circuit and operative to counteract an inductance of the series-resonant circuit, a switching circuit operative to alternately apply first and second voltages to an input of the multi-resonant circuit, and a rectifier circuit coupled to an output of the multi-resonant circuit.

2. (Original) A power converter apparatus according to claim 1, wherein the frequency-dependent impedance decreases with an increase in frequency at which the first and second voltages are applied to the multi-resonant circuit.

3. (Previously Presented) A power converter apparatus according to claim 1, wherein the frequency- impedance comprises a second series- resonant circuit.

4. (Original) A power converter apparatus, comprising:
a multi-resonant circuit comprising cascaded first and second series-resonant stages having respective first and second resonant frequencies;
a switching circuit operative to alternately apply first and second voltages to an input of the multi-resonant circuit; and
a rectifier circuit coupled to an output of the multi-resonant circuit .

5. (Previously Presented) An apparatus according to claim 4, wherein the first resonant frequency is less than the second resonant frequency.

6. (Original) An apparatus according to claim 5, wherein the first series-resonant stage is configured to allow the second series-resonant stage to operate at the second resonant frequency while maintaining inductive loading of the switching circuit.

7. (Previously Presented) An apparatus according to claim, further comprising a clamping circuit coupled to the multi-resonant circuit and operative to limit a voltage at the output of the multi-resonant circuit.

8. (Original) An apparatus according to claim 7, wherein the clamping circuit is configured to limit capacitive loading of the switching circuit by the second series-resonant stage.

9. (Previously Presented) An apparatus according to claim 4, wherein the first and second resonant stages comprise respective series combinations of a capacitor and an inductor.

10. (Original) An apparatus according to claim 9, wherein the inductors of the first and second series-resonant stages comprise an inductance of a primary winding of a transformer, and wherein the rectifier circuit is coupled to a secondary winding of the transformer.

11. (Previously Presented) An apparatus according to claim 4, wherein the first and second series-resonant stages comprise an inductance of primary winding of a transformer, and wherein the rectifier circuit is coupled to a secondary winding of the transformer.

12. (Previously Presented) An apparatus according to claim 1:
wherein the switching circuit is operative to alternately couple first and second terminals of a DC power source to an input of the multi-resonant circuit; and
wherein the multi-resonant circuit comprises:
a first capacitor having a first terminal coupled to the switching circuit;
an inductor having a first terminal coupled to a second terminal of the first capacitor; and

a second capacitor having a first terminal coupled to a second terminal of the inductor and a second terminal configured to be coupled to one of the first and second terminals of the DC power source.

13. (Original) An apparatus according to claim 12, wherein the second capacitor comprises two capacitors configured to be coupled between the second terminal of the inductor and respective ones of the first and second terminals of the DC power source.

14. (Previously Presented) An apparatus according to claim 1:
wherein the multi-resonant circuit comprises a series combination of a first capacitor, first and second primary windings of respective first and second transformers, and a second capacitor; and

wherein the rectifier circuit comprises a self-driven synchronous rectifier circuit coupled to first and second secondary windings of the first and second transformers.

15. (Previously Presented) An apparatus according to claim 1:
wherein the multi-resonant circuit comprises a series combination of a first capacitor, first and second primary windings of respective first and second transformers, and a second capacitor; and

wherein the rectifier circuit comprises a diode rectifier circuit coupled to first and second secondary windings of the first and second transformers.

16. (Previously Presented) An apparatus according to claim 1, wherein the switching circuit comprises a half-bridge circuit.

17. (Previously Presented) A power conversion method, comprising alternatively applying first and second voltages to an input of a multi-resonant circuit comprising a series-resonant circuit and a frequency-dependent impedance connected in series with the series-resonant circuit and operative to counteract an inductance of the series-resonant circuit; and

responsively generating a DC voltage from a voltage at the output of the multi-resonant circuit.

18. (Previously Presented) A power conversion method according to claim 17, wherein the frequency-dependent impedance comprises a second series-resonant circuit.

19. (Previously Presented) A power conversion method according to claim 17, wherein the frequency-dependent impedance decreases with an increase in frequency at which the first and second voltages are applied to the multi-resonant circuit.

20. (Previously Presented) A power conversion method, comprising:
alternately applying first and second voltages to an input of a multi-resonant circuit comprising cascaded first and second series-resonant stages having respective first and second resonant frequencies; and
responsively generating a DC voltage from a voltage at an output of the multi-resonant circuit.

21. (Previously Presented) A method according to claim 20, wherein the first resonant frequency is less than the second resonant frequency.

22. (Previously Presented) A method according to claim 20, wherein the first and second resonant stages comprise respective series combinations of a capacitor and an inductor.

23. (Original) A method according to claim 22, wherein the inductors of the first and second resonant stages comprise a primary winding of a transformer, and wherein generating a DC voltage comprises generating the DC voltage from a voltage on a secondary winding of the transformer.

24. (Previously Presented) A method according to claim 20, wherein the multi-resonant circuit comprises:

a first capacitor having a first terminal coupled to the switching circuit;

an inductor having a first terminal coupled to a second terminal of the first capacitor;

and

a second capacitor having a first terminal coupled to a second terminal of the inductor and a second terminal configured to be coupled to one of the first and second terminals of the DC power source.

25. (Previously Presented) A method according to claim 20:

wherein the multi-resonant circuit comprises a series combination of a first capacitor, first and second primary windings of first and second transformers and a second capacitor; and

wherein the generating a DC voltage comprises generating the DC voltage from a self-driven synchronous rectifier circuit coupled to first and second secondary windings of the first and second transformers.

26.-27. (Withdrawn)